

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of the Claims

1. (original) A GLP-1 compound comprising a GLP-1 peptide modified with a reactive group that reacts with a thiol group on a blood component to form a covalent bond, wherein said reactive group is selected from the group consisting of an activated disulfide bond group or an S-sulfonate.
2. (original) The GLP-1 compound of claim 1, said GLP-1 peptide having the amino acid sequence of formula 1 (SEQ ID NO:1)

Xaa<sub>7</sub>-Xaa<sub>8</sub>-Glu-Gly-Thr-Xaa<sub>12</sub>-Thr-Ser-Asp-Xaa<sub>16</sub>-Ser-Xaa<sub>18</sub>-Xaa<sub>19</sub>-Xaa<sub>20</sub>-Glu-Xaa<sub>22</sub>-Gln-Ala-Xaa<sub>25</sub>-Lys-Xaa<sub>27</sub>-Phe-Ile-Xaa<sub>30</sub>-Trp-Leu-Xaa<sub>33</sub>-Lys-Gly-Arg-Xaa<sub>37</sub>

Formula 1 (SEQ ID NO: 1)

wherein:

Xaa<sub>7</sub> is: L-histidine, D-histidine, desamino-histidine, 2-amino-histidine,  $\beta$ -hydroxy-histidine, homohistidine,  $\alpha$ -fluoromethyl-histidine, or  $\alpha$ -methyl-histidine;

Xaa<sub>8</sub> is: Ala, Gly, Val, Leu, Ile, Ser, or Thr;

Xaa<sub>12</sub> is: Phe, Trp, or Tyr;

Xaa<sub>16</sub> is: Val, Trp, Ile, Leu, Phe, or Tyr;

Xaa<sub>18</sub> is: Ser, Trp, Tyr, Phe, Lys, Ile, Leu, Val;

Xaa<sub>19</sub> is: Tyr, Trp, or Phe;

Xaa<sub>20</sub> is: Leu, Phe, Tyr, or Trp;

Xaa<sub>22</sub> is: Gly, Glu, Asp, Lys;

Xaa<sub>25</sub> is: Ala, Val, Ile, or Leu;

Xaa<sub>27</sub> is: Glu, Ile, or Ala;

Xaa<sub>30</sub> is: Ala or Glu;

Xaa<sub>33</sub> is: Val, or Ile;

Xaa<sub>37</sub> is: L-Cys, D-Cys, homocysteine, or penicillamine;

wherein said GLP-1 peptide is modified at Xaa<sub>37</sub>; and

provided that the GLP-1 compound does not have the sequence of GLP-1(7-37)OH, GLP-1(7-36)-NH<sub>2</sub>, Gly<sup>8</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-GLP-1(7-

37)OH, Val<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Tyr<sup>12</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Tyr<sup>12</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Tyr<sup>16</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Tyr<sup>16</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Glu<sup>22</sup>-GLP-1(7-37)OH, Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Asp<sup>22</sup>-GLP-1(7-37)OH, Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Lys<sup>22</sup>-GLP-1(7-37)OH, Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Ala<sup>27</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Glu<sup>22</sup>-Ala<sup>27</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>.

3. (original) The GLP-1 compound of claim 1, said GLP-1 peptide having the amino acid sequence of formula 2 (SEQ ID NO:2)

Xaa<sup>7</sup>-Xaa<sup>8</sup>-Glu-Gly-Thr-Phe-Thr-Ser-Asp-Xaa<sup>16</sup>-Ser-Xaa<sup>18</sup>-Tyr-Leu-Glu-Xaa<sup>22</sup>-Gln-Ala-Xaa<sup>25</sup>-Lys-Glu-Phe-Ile-Ala-Trp-Leu-Xaa<sup>33</sup>-Lys-Gly-Arg-Xaa<sup>37</sup>

Formula 2 (SEQ ID NO:2)

wherein:

Xaa<sub>7</sub> is: L-histidine, D-histidine, desamino-histidine, 2-amino-histidine, β-hydroxy-histidine, homohistidine, α-fluoromethyl-histidine, or α-methyl-histidine;

Xaa<sub>8</sub> is: Gly, Ala, Val, Leu, Ile, Ser, or Thr;

Xaa<sub>16</sub> is: Val, Phe, Tyr, or Trp;

Xaa<sub>18</sub> is: Ser, Tyr, Trp, Phe, Lys, Ile, Leu, or Val;

Xaa<sub>22</sub> is: Gly, Glu, Asp, or Lys;

Xaa<sub>25</sub> is: Ala, Val, Ile, or Leu;

Xaa<sub>33</sub> is: Val or Ile; and

Xaa<sub>37</sub> is: L-Cys, D-Cys, homocysteine, or penicillamine;

wherein said GLP-1 peptide is modified at Xaa<sub>33</sub>; and

provided that the GLP-1 compound does not have the sequence of GLP-1(7-37)OH, GLP-1(7-36)-NH<sub>2</sub>, Gly<sup>8</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Tyr<sup>16</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Tyr<sup>16</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Glu<sup>22</sup>-GLP-1(7-37)OH, Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Asp<sup>22</sup>-GLP-1(7-37)OH, Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Lys<sup>22</sup>-GLP-1(7-37)OH, Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>.

4. (original) The GLP-1 compound of claim 1, wherein said GLP-1 peptide is an extended GLP-1 peptide having the amino acid sequence of formula 3 (SEQ ID NO:3)

Xaa7-Xaa8-Glu-Gly-Thr-Xaa12-Thr-Ser-Asp-Xaa16-Ser-Xaa18-Xaa19-Xaa20-Glu-  
Xaa22-Gln-Ala-Xaa25-Lys-Xaa27-Phe-Ile-Xaa30-Trp-Leu-Xaa33-Xaa34-Gly-  
Xaa36-Xaa37-Xaa38-Xaa39-Xaa40-Xaa41-Xaa42-Xaa43-Xaa44-Xaa45-Xaa46-Xaa47-  
Xaa48

Formula 3 (SEQ ID NO:3)

wherein:

Xaa7 is: L-histidine, D-histidine, desamino-histidine, 2-amino-histidine,  $\beta$ -hydroxy-histidine, homohistidine,  $\alpha$ -fluoromethyl-histidine, or  $\alpha$ -methyl-histidine;

Xaa8 is: Ala, Gly, Val, Leu, Ile, Ser, or Thr;

Xaa12 is: Phe, Trp, or Tyr;

Xaa16 is: Val, Trp, Ile, Leu, Phe, or Tyr;

Xaa18 is: Ser, Trp, Tyr, Phe, Lys, Ile, Leu, Val;

Xaa19 is: Tyr, Trp, or Phe;

Xaa20 is: Leu, Phe, Tyr, or Trp;

Xaa22 is: Gly, Glu, Asp, or Lys;

Xaa25 is: Ala, Val, Ile, or Leu;

Xaa27 is: Glu, Ile, or Ala;

Xaa30 is: Ala or Glu;

Xaa33 is: Val or Ile;

Xaa34 is: Lys, Asp, Arg, or Glu;

Xaa36 is: Gly, Pro, or Arg;

Xaa37 is: Gly, Pro, Ser, L-Cys, D-Cys, homocysteine, or penicillamine;

Xaa38 is: Ser, Pro, His, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>;

Xaa39 is: Ser, Arg, Thr, Trp, Lys, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa40 is: Ser, Gly, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa41 is: Ala, Asp, Arg, Glu, Lys, Gly, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa42 is: Pro, Ala, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa43 is: Pro, Ala, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>44</sub> is: Pro, Ala, Arg, Lys, His, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>45</sub> is: Ser, His, Pro, Lys, Arg, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>46</sub> is: His, Ser, Arg, Lys, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>47</sub> is: His, Ser, Arg, Lys, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent; and

Xaa<sub>48</sub> is: L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

wherein said extended GLP-1 peptide contains a single L-Cys, D-Cys, homocysteine, or penicillamine which occurs at one of Xaa<sub>37</sub>, Xaa<sub>38</sub>, Xaa<sub>39</sub>, Xaa<sub>40</sub>, Xaa<sub>41</sub>, Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, Xaa<sub>47</sub>, or Xaa<sub>48</sub>, said GLP-1 is modified at said single L-Cys, D-Cys, homocysteine, or penicillamine; and

provided that if Xaa<sub>39</sub>, Xaa<sub>40</sub>, Xaa<sub>41</sub>, Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, or Xaa<sub>47</sub> is absent each amino acid downstream is absent and further provided that the GLP-1 peptide does not have the following C-terminal amino acid extension beginning at Xaa<sub>36</sub>: Gly-Pro-Ser-Ser-Gly-Ala-Pro-Pro-Pro-Ser-NH<sub>2</sub>.

5. (original) The GLP-1 compound of claim 1, wherein said GLP-1 peptide is an extended GLP-1 peptide having the amino acid sequence of formula 4 (SEQ ID NO:4)

Xaa<sub>7</sub>-Xaa<sub>8</sub>-Glu-Gly-Thr-Phe-Thr-Ser-Asp-Xaa<sub>16</sub>-Ser-Ser-Tyr-Lys-Glu-Xaa<sub>22</sub>-  
Gln-Ala-Xaa<sub>25</sub>-Lys-Glu-Phe-Ile-Ala-Trp-Leu-Xaa<sub>33</sub>-Xaa<sub>34</sub>-Gly-Xaa<sub>36</sub>-Xaa<sub>37</sub>-  
Xaa<sub>38</sub>-Xaa<sub>39</sub>-Xaa<sub>40</sub>-Xaa<sub>41</sub>-Xaa<sub>42</sub>-Xaa<sub>43</sub>-Xaa<sub>44</sub>-Xaa<sub>45</sub>-Xaa<sub>46</sub>-Xaa<sub>47</sub>-Xaa<sub>48</sub>

Formula 4 (SEQ ID NO: 4)

wherein:

Xaa<sub>7</sub> is: L-histidine, D-histidine, desamino-histidine, 2-amino-histidine,  $\beta$ -hydroxy-histidine, homohistidine,  $\alpha$ -fluoromethyl-histidine, or  $\alpha$ -methyl-histidine;

Xaa<sub>8</sub> is: Gly, Val, Leu, Ile, Ser, or Thr;

Xaa<sub>16</sub> is: Val, Trp, Ile, Leu, Phe, or Tyr;

Xaa<sub>22</sub> is: Gly, Glu, Asp, or Lys;

Xaa<sub>25</sub> is: Ala, Val, Ile, or Leu;

Xaa<sub>33</sub> is: Val or Ile;

Xaa<sub>34</sub> is: Lys, Asp, Arg, or Glu;

Xaa<sub>36</sub> is: Gly, Pro, or Arg;

Xaa<sub>37</sub> is: Gly, Pro, Ser, L-Cys, D-Cys, homocysteine, or penicillamine;  
 Xaa<sub>38</sub> is: Ser, Pro, His, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;  
 Xaa<sub>39</sub> is: Ser, Arg, Thr, Trp, Lys, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;  
 Xaa<sub>40</sub> is: Ser, Gly, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;  
 Xaa<sub>41</sub> is: Ala, Asp, Arg, Glu, Lys, Gly, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;  
 Xaa<sub>42</sub> is: Pro, Ala, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;  
 Xaa<sub>43</sub> is: Pro, Ala, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;  
 Xaa<sub>44</sub> is: Pro, Ala, Arg, Lys, His, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;  
 Xaa<sub>45</sub> is: Ser, His, Pro, Lys, Arg, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;  
 Xaa<sub>46</sub> is: His, Ser, Arg, Lys, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;  
 Xaa<sub>47</sub> is: His, Ser, Arg, Lys, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;  
 and  
 Xaa<sub>48</sub> is: L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;  
 wherein said extended GLP-1 peptide contains a single L-Cys, D-Cys, homocysteine, or penicillamine which occurs at one of Xaa<sub>37</sub>, Xaa<sub>38</sub>, Xaa<sub>39</sub>, Xaa<sub>40</sub>, Xaa<sub>41</sub>, Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, Xaa<sub>47</sub>, or Xaa<sub>48</sub>, said GLP-1 is modified at said single L-Cys, D-Cys, homocysteine, or penicillamine; and provided that if Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, or Xaa<sub>47</sub> is absent each amino acid downstream is absent and further provided that the GLP-1 peptide does not have the following C-terminal amino acid extension beginning at Xaa<sub>36</sub>: Gly-Pro-Ser-Ser-Gly-Ala-Pro-Pro-Pro-Ser-NH<sub>2</sub>.

6. (original) The GLP-1 compound of claim 1, wherein said GLP-1 peptide is an extended GLP-1 peptide having the amino acid sequence of formula 5 (SEQ ID NO:5)

Xaa7-Xaa8-Glu-Gly-Thr-Phe-Thr-Ser-Asp-Val-Ser-Ser-Tyr-Lys-Glu-Xaa<sub>22</sub>-  
 Gln-Ala-Xaa<sub>25</sub>-Lys-Glu-Phe-Ile-Ala-Trp-Leu-Xaa<sub>33</sub>-Lys-Gly-Gly-Pro-Xaa<sub>38</sub>-  
 Xaa<sub>39</sub>-Xaa<sub>40</sub>-Xaa<sub>41</sub>-Xaa<sub>42</sub>-Xaa<sub>43</sub>-Xaa<sub>44</sub>-Xaa<sub>45</sub>-Xaa<sub>46</sub>-Xaa<sub>47</sub>- Xaa<sub>48</sub>

Formula 5 (SEQ ID NO:5)

wherein:

Xaa<sub>7</sub> is: L-histidine, D-histidine, desamino-histidine, 2-amino-histidine, β-hydroxy-histidine, homohistidine, α-fluoromethyl-histidine, or α-methyl-histidine;

Xaa<sub>8</sub> is: Gly, Val, Leu, Ile, Ser, or Thr;

Xaa<sub>22</sub> is: Gly, Glu, Asp, or Lys;

Xaa<sub>25</sub> is: Ala, Val, Ile, or Leu;

Xaa<sub>33</sub> is: Val or Ile;

Xaa<sub>38</sub> is: Ser, Pro, His, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>39</sub> is: Ser, Arg, Thr, Trp, Lys, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>40</sub> is: Ser, Gly, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>41</sub> is: Ala, Asp, Arg, Glu, Lys, Gly, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>42</sub> is: Pro, Ala, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>43</sub> is: Pro, Ala, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>44</sub> is: Pro, Ala, Arg, Lys, His, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>45</sub> is: Ser, His, Pro, Lys, Arg, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>46</sub> is: His, Ser, Arg, Lys, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>47</sub> is: His, Ser, Arg, Lys, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent; and

Xaa<sub>48</sub> is: L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

wherein said extended GLP-1 peptide contains a single L-Cys, D-Cys, homocysteine, or penicillamine which occurs at one of Xaa<sub>38</sub>, Xaa<sub>39</sub>, Xaa<sub>40</sub>, Xaa<sub>41</sub>, Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, Xaa<sub>47</sub>, or Xaa<sub>48</sub>, said GLP-1 is modified at said single L-Cys, D-Cys, homocysteine, or penicillamine; and provided that if Xaa<sub>38</sub>, Xaa<sub>39</sub>, Xaa<sub>40</sub>, Xaa<sub>41</sub>, Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, or Xaa<sub>47</sub> is absent each amino acid downstream is absent.

7. (original) The GLP-1 compound of claim 1, wherein said GLP-1 peptide is an extended GLP-1 peptide having the amino acid sequence of formula 6 (SEQ ID NO:6)

Xaa<sub>7</sub>-Xaa<sub>8</sub>-Glu-Gly-Thr-Xaa<sub>12</sub>-Thr-Ser-Asp-Xaa<sub>16</sub>-Ser-Xaa<sub>18</sub>-Xaa<sub>19</sub>-Xaa<sub>20</sub>-Glu-Xaa<sub>22</sub>-Gln-Ala-Xaa<sub>25</sub>-Lys-Xaa<sub>27</sub>-Phe-Ile-Xaa<sub>30</sub>-Trp-Leu-Xaa<sub>33</sub>-Xaa<sub>34</sub>-Gly-

Xaa<sub>36</sub>-Xaa<sub>37</sub>-Xaa<sub>38</sub>-Xaa<sub>39</sub>-Xaa<sub>40</sub>-Xaa<sub>41</sub>-Xaa<sub>42</sub>-Xaa<sub>43</sub>-Xaa<sub>44</sub>-Xaa<sub>45</sub>-Xaa<sub>46</sub>-Xaa<sub>47</sub>-  
Xaa<sub>48</sub>-Xaa<sub>49</sub>-Xaa<sub>50</sub>-Xaa<sub>51</sub>

Formula 6 (SEQ ID NO:6)

wherein:

Xaa<sub>7</sub> is: L-histidine, D-histidine, desamino-histidine, 2-amino-histidine,  $\beta$ -hydroxy-histidine, homohistidine,  $\alpha$ -fluoromethyl-histidine, or  $\alpha$ -methyl-histidine;

Xaa<sub>8</sub> is: Ala, Gly, Val, Leu, Ile, Ser, or Thr;

Xaa<sub>12</sub> is: Phe, Trp, or Tyr;

Xaa<sub>16</sub> is: Val, Trp, Ile, Leu, Phe, or Tyr;

Xaa<sub>18</sub> is: Ser, Trp, Tyr, Phe, Lys, Ile, Leu, Val;

Xaa<sub>19</sub> is: Tyr, Trp, or Phe;

Xaa<sub>20</sub> is: Leu, Phe, Tyr, or Trp;

Xaa<sub>22</sub> is: Gly, Glu, Asp, or Lys;

Xaa<sub>25</sub> is: Ala, Val, Ile, or Leu;

Xaa<sub>27</sub> is: Glu, Ile, or Ala;

Xaa<sub>30</sub> is: Ala or Glu

Xaa<sub>33</sub> is: Val or Ile;

Xaa<sub>34</sub> is: Lys, Asp, Arg, or Glu;

Xaa<sub>36</sub> is: Gly, Pro, or Arg;

Xaa<sub>37</sub> is: Gly, Pro, or Ser;

Xaa<sub>38</sub> is: Ser, Pro, or His;

Xaa<sub>39</sub> is: Ser, Arg, Thr, Trp, or Lys;

Xaa<sub>40</sub> is: Ser or Gly;

Xaa<sub>41</sub> is: Ala, Asp, Arg, Glu, Lys, or Gly;

Xaa<sub>42</sub> is: Pro, Ala, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>43</sub> is: Pro, Ala, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>44</sub> is: Pro, Ala, Arg, Lys, His, NH<sub>2</sub>, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>45</sub> is: Ser, His, Pro, Lys, Arg, Gly, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>46</sub> is: His, Ser, Arg, Lys, Pro, Gly, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>47</sub> is: His, Ser, Arg, Lys, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;



Xaa<sub>48</sub> is: Gly, His, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>49</sub> is: Pro, His, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>50</sub> is: Ser, His, Ser-NH<sub>2</sub>, His-NH<sub>2</sub>, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent; and

Xaa<sub>51</sub> is: L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

wherein said extended GLP-1 peptide contains a single L-Cys, D-Cys, homocysteine, or penicillamine which occurs at one of Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, Xaa<sub>47</sub>, Xaa<sub>48</sub>, Xaa<sub>49</sub>, Xaa<sub>50</sub>, or Xaa<sub>51</sub> said GLP-1 is modified at said single L-Cys, D-Cys, homocysteine, or penicillamine; and provided that if Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, Xaa<sub>47</sub>, Xaa<sub>48</sub>, Xaa<sub>49</sub>, or Xaa<sub>50</sub>, is absent each amino acid downstream is absent and

further provided that if Xaa<sub>36</sub> is Arg and Xaa<sub>37</sub> is Gly or Ser, the GLP-1 peptide does not have the following C-terminal amino acid extension beginning at Xaa<sub>38</sub>: Ser-Ser-Gly-Ala-Pro-Pro-Pro-Ser-NH<sub>2</sub>.

8. (original) The GLP-1 compound of claim 1, wherein said GLP-1 peptide is an extended GLP-1 peptide having the amino acid sequence of formula 7 (SEQ ID NO:7)

His-Ala-Glu-Gly-Thr-Phe-Thr-Ser-Asp-Val-Ser-Ser-Tyr-Leu-Glu-Gly-Gln-Ala-Ala-Lys-Glu-Phe-Ile-Ala-Trp-Leu-Val-Lys-Gly-Gly-Pro-Xaa<sub>38</sub>-Xaa<sub>39</sub>-Xaa<sub>40</sub>-Xaa<sub>41</sub>-Xaa<sub>42</sub>-Xaa<sub>43</sub>-Xaa<sub>44</sub>-Xaa<sub>45</sub>-Xaa<sub>46</sub>-Xaa<sub>47</sub>-Xaa<sub>48</sub>-Xaa<sub>49</sub>-Xaa<sub>50</sub>-Xaa<sub>51</sub>

Formula 7 (SEQ ID NO:7)

Wherein:

Xaa<sub>38</sub> is: Ser, Pro, or His;

Xaa<sub>39</sub> is: Ser, Arg, Thr, Trp, or Lys;

Xaa<sub>40</sub> is: Ser or Gly;

Xaa<sub>41</sub> is: Ala, Asp, Arg, Glu, Lys, or Gly;

Xaa<sub>42</sub> is: Pro, Ala, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>43</sub> is: Pro, Ala, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>44</sub> is: Pro, Ala, Arg, Lys, His, NH<sub>2</sub>, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>45</sub> is: Ser, His, Pro, Lys, Arg, Gly, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>46</sub> is: His, Ser, Arg, Lys, Pro, Gly, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>47</sub> is: His, Ser, Arg, Lys, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;  
Xaa<sub>48</sub> is: Gly, His, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;  
Xaa<sub>49</sub> is: Pro, His, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;  
Xaa<sub>50</sub> is: Ser, His, Ser-NH<sub>2</sub>, His-NH<sub>2</sub>, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent; and  
Xaa<sub>51</sub> is: L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;  
wherein said extended GLP-1 peptide contains a single L-Cys, D-Cys, homocysteine, or penicillamine which occurs at one of Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, Xaa<sub>47</sub>, Xaa<sub>48</sub>, Xaa<sub>49</sub>, Xaa<sub>50</sub>, or Xaa<sub>51</sub> said GLP-1 is modified at said single L-Cys, D-Cys, homocysteine, or penicillamine; and provided that if Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, Xaa<sub>47</sub>, Xaa<sub>48</sub>, Xaa<sub>49</sub>, or Xaa<sub>50</sub>, is absent each amino acid downstream is absent.

9. (original) The GLP-1 compound of Claim 1, said GLP-1 peptide having the amino acid sequence of formula 8 (SEQ ID NO:8)

Xaa<sub>7</sub>-Xaa<sub>8</sub>-Glu-Gly-Thr-Xaa<sub>12</sub>-Thr-Ser-Asp-Xaa<sub>16</sub>-Ser-Xaa<sub>18</sub>-Xaa<sub>19</sub>-Xaa<sub>20</sub>-Glu-Xaa<sub>22</sub>-Gln-Ala-Xaa<sub>25</sub>-Lys-Xaa<sub>27</sub>-Phe-Ile-Xaa<sub>30</sub>-Trp-Leu-Xaa<sub>33</sub>-Lys-Gly-Arg-Lys

Formula 8 (SEQ ID NO:8)

wherein:

Xaa<sub>7</sub> is: L-histidine, D-histidine, desamino-histidine, 2-amino-histidine, β-hydroxy-histidine, homohistidine, α-fluoromethyl-histidine, or α-methyl-histidine;  
Xaa<sub>8</sub> is: Ala, Gly, Val, Leu, Ile, Ser, or Thr;  
Xaa<sub>12</sub> is: Phe, Trp, or Tyr;  
Xaa<sub>16</sub> is: Val, Trp, Ile, Leu, Phe, or Tyr;  
Xaa<sub>18</sub> is: Ser, Trp, Tyr, Phe, Lys, Ile, Leu, Val;  
Xaa<sub>19</sub> is: Tyr, Trp, or Phe;  
Xaa<sub>20</sub> is: Leu, Phe, Tyr, or Trp;  
Xaa<sub>22</sub> is: Gly, Glu, Asp, Lys;  
Xaa<sub>25</sub> is: Ala, Val, Ile, or Leu;  
Xaa<sub>27</sub> is: Glu, Ile, or Ala;  
Xaa<sub>30</sub> is: Ala or Glu; and  
Xaa<sub>33</sub> is: Val, or Ile;

wherein said GLP-1 peptide is modified at Lys<sup>37</sup>; and,

provided that the GLP-1 compound does not have the sequence of GLP-1(7-37)OH, GLP-1(7-36)-NH<sub>2</sub>, Gly<sup>8</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Tyr<sup>12</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Tyr<sup>12</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Tyr<sup>16</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Tyr<sup>16</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Glu<sup>22</sup>-GLP-1(7-37)OH, Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Asp<sup>22</sup>-GLP-1(7-37)OH, Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Lys<sup>22</sup>-GLP-1(7-37)OH, Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Ala<sup>27</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Glu<sup>22</sup>-Ala<sup>27</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Lys<sup>37</sup>-GLP-1(7-37)OH.

- 10 (original) The GLP-1 compound of Claim 1, said GLP-1 peptide having the amino acid sequence of formula 9 (SEQ ID NO:9)

Xaa<sub>7</sub>-Xaa<sub>8</sub>-Glu-Gly-Thr-Phe-Thr-Ser-Asp-Xaa<sub>16</sub>-Ser-Xaa<sub>18</sub>-Tyr-Leu-Glu-  
Xaa<sub>22</sub>-Gln-Ala-Xaa<sub>25</sub>-Lys-Glu-Phe-Ile-Ala-Trp-Leu-Xaa<sub>33</sub>-Lys-Gly-Arg-Lys

Formula 9 (SEQ ID NO:9)

wherein:

Xaa<sub>7</sub> is: L-histidine, D-histidine, desamino-histidine, 2-amino-histidine, β-hydroxy-histidine, homohistidine, α-fluoromethyl-histidine, or α-methyl-histidine;

Xaa<sub>8</sub> is: Gly, Ala, Val, Leu, Ile, Ser, or Thr;

Xaa<sub>16</sub> is: Val, Phe, Tyr, or Trp;

Xaa<sub>18</sub> is: Ser, Tyr, Trp, Phe, Lys, Ile, Leu, or Val;

Xaa<sub>22</sub> is: Gly, Glu, Asp, or Lys;

Xaa<sub>25</sub> is: Ala, Val, Ile, or Leu; and

Xaa<sub>33</sub> is: Val or Ile;

wherein said GLP-1 peptide is modified at Lys<sup>37</sup>; and,

provided that the GLP-1 compound does not have the sequence of GLP-1(7-37)OH, GLP-1(7-36)-NH<sub>2</sub>, Gly<sup>8</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Tyr<sup>12</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Tyr<sup>12</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Tyr<sup>16</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Tyr<sup>16</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Glu<sup>22</sup>-GLP-1(7-37)OH, Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Asp<sup>22</sup>-GLP-1(7-37)OH, Asp<sup>22</sup>-GLP-1(7-

36)NH<sub>2</sub>, Lys<sup>22</sup>-GLP-1(7-37)OH, Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Ala<sup>27</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Glu<sup>22</sup>-Ala<sup>27</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Lys<sup>37</sup>-GLP-1(7-37)OH.

11. (original) The GLP-1 compound of Claim 1, wherein said GLP-1 peptide is an extended GLP-1 peptide having the amino acid sequence of formula 10 (SEQ ID NO:10)

Xaa<sub>7</sub>-Xaa<sub>8</sub>-Glu-Gly-Thr-Xaa<sub>12</sub>-Thr-Ser-Asp-Xaa<sub>16</sub>-Ser-Xaa<sub>18</sub>-Xaa<sub>19</sub>-Xaa<sub>20</sub>-Glu-Xaa<sub>22</sub>-Gln-Ala-Xaa<sub>25</sub>-Lys-Xaa<sub>27</sub>-Phe-Ile-Xaa<sub>30</sub>-Trp-Leu-Xaa<sub>33</sub>-Xaa<sub>34</sub>-Gly-Xaa<sub>36</sub>-Xaa<sub>37</sub>-Xaa<sub>38</sub>-Xaa<sub>39</sub>-Xaa<sub>40</sub>-Xaa<sub>41</sub>-Xaa<sub>42</sub>-Xaa<sub>43</sub>-Xaa<sub>44</sub>-Xaa<sub>45</sub>-Xaa<sub>46</sub>-Xaa<sub>47</sub>-Xaa<sub>48</sub>

Formula 10 (SEQ ID NO:10)

wherein:

Xaa<sub>7</sub> is: L-histidine, D-histidine, desamino-histidine, 2-amino-histidine, β-hydroxy-histidine, homohistidine, α-fluoromethyl-histidine, or α-methyl-histidine;

Xaa<sub>8</sub> is: Ala, Gly, Val, Leu, Ile, Ser, or Thr;

Xaa<sub>12</sub> is: Phe, Trp, or Tyr;

Xaa<sub>16</sub> is: Val, Trp, Ile, Leu, Phe, or Tyr;

Xaa<sub>18</sub> is: Ser, Trp, Tyr, Phe, Lys, Ile, Leu, Val;

Xaa<sub>19</sub> is: Tyr, Trp, or Phe;

Xaa<sub>20</sub> is: Leu, Phe, Tyr, or Trp;

Xaa<sub>22</sub> is: Gly, Glu, Asp, or Lys;

Xaa<sub>25</sub> is: Ala, Val, Ile, or Leu;

Xaa<sub>27</sub> is: Glu, Ile, or Ala;

Xaa<sub>30</sub> is: Ala or Glu;

Xaa<sub>33</sub> is: Val or Ile;

Xaa<sub>34</sub> is: Lys, Asp, Arg, or Glu;

Xaa<sub>36</sub> is: Gly, Pro, or Arg;

Xaa<sub>37</sub> is: Gly, Pro, Ser, or Lys;

Xaa<sub>38</sub> is: Ser, Pro, His, Lys, NH<sub>2</sub>;

Xaa<sub>39</sub> is: Ser, Arg, Thr, Trp, Lys, NH<sub>2</sub>, or is absent;

Xaa<sub>40</sub> is: Ser, Gly, Lys, NH<sub>2</sub>, or is absent;

Xaa<sub>41</sub> is: Ala, Asp, Arg, Glu, Lys, Gly, NH<sub>2</sub>, or is absent;

Xaa<sub>42</sub> is: Pro, Ala, Lys, NH<sub>2</sub>, or is absent;

Xaa<sub>43</sub> is: Pro, Ala, Lys, NH<sub>2</sub>, or is absent;

Xaa<sub>44</sub> is: Pro, Ala, Arg, Lys, His, NH<sub>2</sub>, or is absent;

Xaa<sub>45</sub> is: Ser, His, Pro, Lys, Arg, NH<sub>2</sub>, or is absent;

Xaa<sub>46</sub> is: His, Ser, Arg, Lys, NH<sub>2</sub>, or is absent;

Xaa<sub>47</sub> is: His, Ser, Arg, Lys, NH<sub>2</sub>, or is absent; and

Xaa<sub>48</sub> is: Lys, NH<sub>2</sub>, or is absent;

wherein said extended GLP-1 peptide is modified at a single Lys which occurs at one of Xaa<sub>37</sub>, Xaa<sub>38</sub>, Xaa<sub>39</sub>, Xaa<sub>40</sub>, Xaa<sub>41</sub>, Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, Xaa<sub>47</sub>, or Xaa<sub>48</sub>; and provided that if Xaa<sub>39</sub>, Xaa<sub>40</sub>, Xaa<sub>41</sub>, Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, or Xaa<sub>47</sub> is absent each amino acid downstream is absent and further provided that the GLP-1 peptide does not have the following C-terminal amino acid extension beginning at Xaa<sub>36</sub>: Gly-Pro-Ser-Ser-Gly-Ala-Pro-Pro-Pro-Ser-NH<sub>2</sub>.

12. (original) The GLP-1 compound of Claim 1, wherein said GLP-1 peptide is an extended GLP-1 peptide having the amino acid sequence of formula 11 (SEQ ID NO:11)

Xaa<sub>7</sub>-Xaa<sub>8</sub>-Glu-Gly-Thr-Phe-Thr-Ser-Asp-Xaa<sub>16</sub>-Ser-Ser-Tyr-Lys-Glu-Xaa<sub>22</sub>-  
Gln-Ala-Xaa<sub>25</sub>-Lys-Glu-Phe-Ile-Ala-Trp-Leu-Xaa<sub>33</sub>-Xaa<sub>34</sub>-Gly-Xaa<sub>36</sub>-Xaa<sub>37</sub>-  
Xaa<sub>38</sub>-Xaa<sub>39</sub>-Xaa<sub>40</sub>-Xaa<sub>41</sub>-Xaa<sub>42</sub>-Xaa<sub>43</sub>-Xaa<sub>44</sub>-Xaa<sub>45</sub>-Xaa<sub>46</sub>-Xaa<sub>47</sub>-Xaa<sub>48</sub>

Formula 11 (SEQ ID NO:11)

wherein:

Xaa<sub>7</sub> is: L-histidine, D-histidine, desamino-histidine, 2-amino-histidine,  $\beta$ -hydroxy-histidine, homohistidine,  $\alpha$ -fluoromethyl-histidine, or  $\alpha$ -methyl-histidine;

Xaa<sub>8</sub> is: Gly, Val, Leu, Ile, Ser, or Thr;

Xaa<sub>16</sub> is: Val, Trp, Ile, Leu, Phe, or Tyr;  
Xaa<sub>22</sub> is: Gly, Glu, Asp, or Lys;  
Xaa<sub>25</sub> is: Ala, Val, Ile, or Leu;  
Xaa<sub>33</sub> is: Val or Ile;  
Xaa<sub>34</sub> is: Lys, Asp, Arg, or Glu;  
Xaa<sub>36</sub> is: Gly, Pro, or Arg;  
Xaa<sub>37</sub> is: Gly, Pro, Ser, or Lys;  
Xaa<sub>38</sub> is: Ser, Pro, His, Lys, NH<sub>2</sub>, or is absent;  
Xaa<sub>39</sub> is: Ser, Arg, Thr, Trp, Lys, NH<sub>2</sub>, or is absent;  
Xaa<sub>40</sub> is: Ser, Gly, Lys, NH<sub>2</sub>, or is absent;  
Xaa<sub>41</sub> is: Ala, Asp, Arg, Glu, Lys, Gly, NH<sub>2</sub>, or is absent;  
Xaa<sub>42</sub> is: Pro, Ala, Lys, NH<sub>2</sub>, or is absent;  
Xaa<sub>43</sub> is: Pro, Ala, Lys, NH<sub>2</sub>, or is absent;  
Xaa<sub>44</sub> is: Pro, Ala, Arg, Lys, His, NH<sub>2</sub>, or is absent;  
Xaa<sub>45</sub> is: Ser, His, Pro, Lys, Arg, NH<sub>2</sub>, or is absent;  
Xaa<sub>46</sub> is: His, Ser, Arg, Lys, NH<sub>2</sub>, or is absent;  
Xaa<sub>47</sub> is: His, Ser, Arg, Lys, NH<sub>2</sub>, or is absent; and  
Xaa<sub>48</sub> is: Lys, NH<sub>2</sub>, or is absent;

wherein said extended GLP-1 peptide is modified at a single Lys which occurs at one of Xaa<sub>37</sub>, Xaa<sub>38</sub>, Xaa<sub>39</sub>, Xaa<sub>40</sub>, Xaa<sub>41</sub>, Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, Xaa<sub>47</sub>, or Xaa<sub>48</sub>; and provided that if Xaa<sub>39</sub>, Xaa<sub>40</sub>, Xaa<sub>41</sub>, Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, or Xaa<sub>47</sub> is absent each amino acid downstream is absent and further provided that the GLP-1 peptide does not have the following C-terminal amino acid extension beginning at Xaa<sub>36</sub>: Gly-Pro-Ser-Ser-Ser-Gly-Ala-Pro-Pro-Pro-Ser-NH<sub>2</sub>.

13. (original) The GLP-1 compound of Claim 1, wherein said GLP-1 peptide is an extended GLP-1 peptide having the amino acid sequence of formula 12 (SEQ ID NO:12)

Xaa<sub>7</sub>-Xaa<sub>8</sub>-Glu-Gly-Thr-Phe-Thr-Ser-Asp-Val-Ser-Ser-Tyr-Lys-Glu-Xaa<sub>22</sub>-  
Gln-Ala-Xaa<sub>25</sub>-Lys-Glu-Phe-Ile-Ala-Trp-Leu-Xaa<sub>33</sub>-Lys-Gly-Gly-Pro-Xaa<sub>38</sub>-  
Xaa<sub>39</sub>-Xaa<sub>40</sub>-Xaa<sub>41</sub>-Xaa<sub>42</sub>-Xaa<sub>43</sub>-Xaa<sub>44</sub>-Xaa<sub>45</sub>-Xaa<sub>46</sub>-Xaa<sub>47</sub>- Xaa<sub>48</sub>

Formula 12 (SEQ ID NO:12)

wherein:

Xaa<sub>7</sub> is: L-histidine, D-histidine, desamino-histidine, 2-amino-histidine,  $\beta$ -hydroxy-histidine, homohistidine,  $\alpha$ -fluoromethyl-histidine, or  $\alpha$ -methyl-histidine;

Xaa<sub>8</sub> is: Gly, Val, Leu, Ile, Ser, or Thr;

Xaa<sub>22</sub> is: Gly, Glu, Asp, or Lys;

Xaa<sub>25</sub> is: Ala, Val, Ile, or Leu;

Xaa<sub>33</sub> is: Val or Ile;

Xaa<sub>38</sub> is: Ser, Pro, His, Lys, NH<sub>2</sub>, or is absent;

Xaa<sub>39</sub> is: Ser, Arg, Thr, Trp, Lys, NH<sub>2</sub>, or is absent;

Xaa<sub>40</sub> is: Ser, Gly, Lys, NH<sub>2</sub>, or is absent;

Xaa<sub>41</sub> is: Ala, Asp, Arg, Glu, Lys, Gly, NH<sub>2</sub>, or is absent;

Xaa<sub>42</sub> is: Pro, Ala, Lys, NH<sub>2</sub>, or is absent;

Xaa<sub>43</sub> is: Pro, Ala, Lys, NH<sub>2</sub>, or is absent;

Xaa<sub>44</sub> is: Pro, Ala, Arg, Lys, His, NH<sub>2</sub>, or is absent;

Xaa<sub>45</sub> is: Ser, His, Pro, Lys, Arg, NH<sub>2</sub>, or is absent;

Xaa<sub>46</sub> is: His, Ser, Arg, Lys, NH<sub>2</sub>, or is absent;

Xaa<sub>47</sub> is: His, Ser, Arg, Lys, NH<sub>2</sub>, or is absent; and

Xaa<sub>48</sub> is: Lys, NH<sub>2</sub>, or is absent;

wherein said extended GLP-1 peptide is modified at a single Lys which occurs at one of Xaa<sub>37</sub>, Xaa<sub>38</sub>, Xaa<sub>39</sub>, Xaa<sub>40</sub>, Xaa<sub>41</sub>, Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, Xaa<sub>47</sub>, or Xaa<sub>48</sub>; and provided that if Xaa<sub>38</sub>, Xaa<sub>39</sub>, Xaa<sub>40</sub>, Xaa<sub>41</sub>, Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, or Xaa<sub>47</sub> is absent each amino acid downstream is absent.

14. (original) The GLP-1 compound of Claim 1, wherein said GLP-1 peptide is an extended GLP-1 peptide having the amino acid sequence of formula 13 (SEQ ID NO:13)

Xaa<sub>7</sub>-Xaa<sub>8</sub>-Glu-Gly-Thr-Xaa<sub>12</sub>-Thr-Ser-Asp-Xaa<sub>16</sub>-Ser-Xaa<sub>18</sub>-Xaa<sub>19</sub>-Xaa<sub>20</sub>-Glu-Xaa<sub>22</sub>-Gln-Ala-Xaa<sub>25</sub>-Lys-Xaa<sub>27</sub>-Phe-Ile-Xaa<sub>30</sub>-Trp-Leu-Xaa<sub>33</sub>-Xaa<sub>34</sub>-Gly-Xaa<sub>36</sub>-Xaa<sub>37</sub>-Xaa<sub>38</sub>-Xaa<sub>39</sub>-Xaa<sub>40</sub>-Xaa<sub>41</sub>-Xaa<sub>42</sub>-Xaa<sub>43</sub>-Xaa<sub>44</sub>-Xaa<sub>45</sub>-Xaa<sub>46</sub>-Xaa<sub>47</sub>-Xaa<sub>48</sub>-Xaa<sub>49</sub>-Xaa<sub>50</sub>-Xaa<sub>51</sub>

Formula 13 (SEQ ID NO:13)

wherein:

Xaa<sub>7</sub> is: L-histidine, D-histidine, desamino-histidine, 2-amino-histidine,  $\beta$ -hydroxy-histidine, homohistidine,  $\alpha$ -fluoromethyl-histidine, or  $\alpha$ -methyl-histidine;



Xaa<sub>8</sub> is: Ala, Gly, Val, Leu, Ile, Ser, or Thr;  
Xaa<sub>12</sub> is: Phe, Trp, or Tyr;  
Xaa<sub>16</sub> is: Val, Trp, Ile, Leu, Phe, or Tyr;  
Xaa<sub>18</sub> is: Ser, Trp, Tyr, Phe, Lys, Ile, Leu, Val;  
Xaa<sub>19</sub> is: Tyr, Trp, or Phe;  
Xaa<sub>20</sub> is: Leu, Phe, Tyr, or Trp;  
Xaa<sub>22</sub> is: Gly, Glu, Asp, or Lys;  
Xaa<sub>25</sub> is: Ala, Val, Ile, or Leu;  
Xaa<sub>27</sub> is: Glu, Ile, or Ala;  
Xaa<sub>30</sub> is: Ala or Glu  
Xaa<sub>33</sub> is: Val or Ile;  
Xaa<sub>34</sub> is: Lys, Asp, Arg, or Glu;  
Xaa<sub>36</sub> is: Gly, Pro, or Arg;  
Xaa<sub>37</sub> is: Gly, Pro, or Ser;  
Xaa<sub>38</sub> is: Ser, Pro, or His;  
Xaa<sub>39</sub> is: Ser, Arg, Thr, Trp, or Lys;  
Xaa<sub>40</sub> is: Ser or Gly;  
Xaa<sub>41</sub> is: Ala, Asp, Arg, Glu, Lys, or Gly;  
Xaa<sub>42</sub> is: Pro, Ala, Lys, NH<sub>2</sub>, or is absent;  
Xaa<sub>43</sub> is: Pro, Ala, Lys, NH<sub>2</sub>, or is absent;  
Xaa<sub>44</sub> is: Pro, Ala, Arg, Lys, His, NH<sub>2</sub>, or is absent;  
Xaa<sub>45</sub> is: Ser, His, Pro, Lys, Arg, NH<sub>2</sub>, or is absent;  
Xaa<sub>46</sub> is: His, Ser, Arg, Lys, NH<sub>2</sub>, or is absent;  
Xaa<sub>47</sub> is: His, Ser, Arg, Lys, NH<sub>2</sub>, or is absent; and  
Xaa<sub>48</sub> is: Lys, NH<sub>2</sub>, or is absent;  
Xaa<sub>49</sub> is: Pro, His, Lys, NH<sub>2</sub>, or is absent;  
Xaa<sub>50</sub> is: Ser, His, Lys, NH<sub>2</sub>, or is absent; and  
Xaa<sub>51</sub> is: Lys, NH<sub>2</sub>, or is absent;

wherein said extended GLP-1 peptide is modified at a single Lys which occurs at one of Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, Xaa<sub>47</sub>, Xaa<sub>48</sub>, Xaa<sub>49</sub>, Xaa<sub>50</sub>, or Xaa<sub>51</sub>; and provided that if Xaa<sub>38</sub>, Xaa<sub>39</sub>, Xaa<sub>40</sub>, Xaa<sub>41</sub>, Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, Xaa<sub>47</sub>, Xaa<sub>48</sub>, Xaa<sub>49</sub>, or Xaa<sub>50</sub>, is absent each amino acid downstream is absent.

15. (original) The GLP-1 compound of Claim 1, wherein said GLP-1 peptide is an extended GLP-1 peptide having the amino acid sequence of formula 14 (SEQ ID NO:14)

His-Ala-Glu-Gly-Thr-Phe-Thr-Ser-Asp-Val-Ser-Ser-Tyr-Leu-Gly-Gln-Ala-Ala-Lys-Glu-Phe-Ile-Ala-Trp-Leu-Val-Lys-Gly-Gly-Pro-Xaa<sub>38</sub>-Xaa<sub>39</sub>-Xaa<sub>40</sub>-Xaa<sub>41</sub>-Xaa<sub>42</sub>-Xaa<sub>43</sub>-Xaa<sub>44</sub>-Xaa<sub>45</sub>-Xaa<sub>46</sub>-Xaa<sub>47</sub>-Xaa<sub>48</sub>-Xaa<sub>49</sub>-Xaa<sub>50</sub>-Xaa<sub>51</sub>

Formula 14 (SEQ ID NO:14)

Wherein:

Xaa<sub>38</sub> is: Ser, Pro, or His;  
Xaa<sub>39</sub> is: Ser, Arg, Thr, Trp, or Lys;  
Xaa<sub>40</sub> is: Ser or Gly;  
Xaa<sub>41</sub> is: Ala, Asp, Arg, Glu, Lys, or Gly;  
Xaa<sub>42</sub> is: Pro, Ala, Lys, NH<sub>2</sub>, or is absent;  
Xaa<sub>43</sub> is: Pro, Ala, Lys, NH<sub>2</sub>, or is absent;  
Xaa<sub>44</sub> is: Pro, Ala, Arg, Lys, His, NH<sub>2</sub>, or is absent;  
Xaa<sub>45</sub> is: Ser, His, Pro, Lys, Arg, NH<sub>2</sub>, or is absent;  
Xaa<sub>46</sub> is: His, Ser, Arg, Lys, NH<sub>2</sub>, or is absent;  
Xaa<sub>47</sub> is: His, Ser, Arg, Lys, NH<sub>2</sub>, or is absent; and  
Xaa<sub>48</sub> is: Lys, NH<sub>2</sub>, or is absent;  
Xaa<sub>49</sub> is: Pro, His, Lys, NH<sub>2</sub>, or is absent;  
Xaa<sub>50</sub> is: Ser, His, Lys, NH<sub>2</sub>, or is absent; and  
Xaa<sub>51</sub> is: Lys, NH<sub>2</sub>, or is absent;

wherein said extended GLP-1 peptide is modified at a single Lys which occurs at one of Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, Xaa<sub>47</sub>, Xaa<sub>48</sub>, Xaa<sub>49</sub>, Xaa<sub>50</sub>, or Xaa<sub>51</sub>; and provided that if Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, Xaa<sub>47</sub>, Xaa<sub>48</sub>, Xaa<sub>49</sub>, or Xaa<sub>50</sub>, is absent each amino acid downstream is absent.

16. (currently amended) The GLP-1 compound of ~~any of claims 1-15~~ Claim 1 wherein said reactive group is an activated disulfide bond group.
17. (currently amended) The GLP-1 compound of ~~any of claims 1-15~~ Claim 1 wherein said reactive group is an S-sulfonate.

18. (original) A GLP-1 compound comprising a GLP-1 peptide modified with a reactive group that reacts with an amino group, a hydroxyl group, or a thiol group on a blood component to form a covalent bond, wherein said reactive group is selected from the group consisting of a succinimidyl group and a maleimido group, said GLP-1 peptide having the amino acid sequence of formula 15 (SEQ ID NO:15)

Xaa7-Xaa8-Glu-Gly-Thr-Xaa12-Thr-Ser-Asp-Xaa16-Ser-Xaa18-Xaa19-Xaa20-Glu-Xaa22-Gln-Ala-Xaa25-Lys-Xaa27-Phe-Ile-Xaa30-Trp-Leu-Xaa33-Lys-Gly-Arg-Xaa37

Formula 15 (SEQ ID NO:15)

wherein:

Xaa7 is: L-histidine, D-histidine, desamino-histidine, 2-amino-histidine,  $\beta$ -hydroxy-histidine, homohistidine,  $\alpha$ -fluoromethyl-histidine, or  $\alpha$ -methyl-histidine;

Xaa8 is: Ala, Gly, Val, Leu, Ile, Ser, or Thr;

Xaa12 is: Phe, Trp, or Tyr;

Xaa16 is: Val, Trp, Ile, Leu, Phe, or Tyr;

Xaa18 is: Ser, Trp, Tyr, Phe, Lys, Ile, Leu, Val;

Xaa19 is: Tyr, Trp, or Phe;

Xaa20 is: Leu, Phe, Tyr, or Trp;

Xaa22 is: Gly, Glu, Asp, Lys;

Xaa25 is: Ala, Val, Ile, or Leu;

Xaa27 is: Glu, Ile, or Ala;

Xaa30 is: Ala or Glu

Xaa33 is: Val, or Ile; and

Xaa37 is: Gly, His, Lys, or NH<sub>2</sub>, or is absent,

provided that the GLP-1 compound does not have the sequence of GLP-1(7-37)OH, GLP-1(7-36)-NH<sub>2</sub>, Gly<sup>8</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Tyr<sup>12</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Tyr<sup>12</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Tyr<sup>16</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Tyr<sup>16</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-

Lys<sup>22</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Glu<sup>22</sup>-GLP-1(7-37)OH, Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Asp<sup>22</sup>-GLP-1(7-37)OH, Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Lys<sup>22</sup>-GLP-1(7-37)OH, Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Ala<sup>27</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Lys<sup>37</sup>-GLP-1(7-37)OH.

19. (original) The GLP-1 compound of Claim 18, wherein Xaa<sub>37</sub> of said GLP-1 peptide is Lys and said GLP-1 peptide is modified at Xaa<sub>37</sub>.
20. (original) A GLP-1 compound comprising an extended GLP-1 peptide modified with a reactive group that reacts with an amino group, a hydroxyl group, or a thiol group on a blood component to form a covalent bond, wherein said reactive group is selected from the group consisting of a succinimidyl group and a maleimido group, said extended GLP-1 peptide having the amino acid sequence of formula 10 (SEQ ID NO:10)

Xaa<sub>7</sub>-Xaa<sub>8</sub>-Glu-Gly-Thr-Xaa<sub>12</sub>-Thr-Ser-Asp-Xaa<sub>16</sub>-Ser-Xaa<sub>18</sub>-Xaa<sub>19</sub>-Xaa<sub>20</sub>-Glu-Xaa<sub>22</sub>-Gln-Ala-Xaa<sub>25</sub>-Lys-Xaa<sub>27</sub>-Phe-Ile-Xaa<sub>30</sub>-Trp-Leu-Xaa<sub>33</sub>-Xaa<sub>34</sub>-Gly-

Xaa<sub>36</sub>-Xaa<sub>37</sub>-Xaa<sub>38</sub>-Xaa<sub>39</sub>-Xaa<sub>40</sub>-Xaa<sub>41</sub>-Xaa<sub>42</sub>-Xaa<sub>43</sub>-Xaa<sub>44</sub>-Xaa<sub>45</sub>-Xaa<sub>46</sub>-Xaa<sub>47</sub>-  
Xaa<sub>48</sub>

Formula 10 (SEQ ID NO:10)

wherein:

Xaa<sub>7</sub> is: L-histidine, D-histidine, desamino-histidine, 2-amino-histidine,  $\beta$ -hydroxy-histidine, homohistidine,  $\alpha$ -fluoromethyl-histidine, or  $\alpha$ -methyl-histidine;

Xaa<sub>8</sub> is: Ala, Gly, Val, Leu, Ile, Ser, or Thr;

Xaa<sub>12</sub> is: Phe, Trp, or Tyr;

Xaa<sub>16</sub> is: Val, Trp, Ile, Leu, Phe, or Tyr;

Xaa<sub>18</sub> is: Ser, Trp, Tyr, Phe, Lys, Ile, Leu, Val;

Xaa<sub>19</sub> is: Tyr, Trp, or Phe;

Xaa<sub>20</sub> is: Leu, Phe, Tyr, or Trp;

Xaa<sub>22</sub> is: Gly, Glu, Asp, or Lys;

Xaa<sub>25</sub> is: Ala, Val, Ile, or Leu;

Xaa<sub>27</sub> is: Glu, Ile, or Ala;

Xaa<sub>30</sub> is: Ala or Glu

Xaa<sub>33</sub> is: Val or Ile;

Xaa<sub>34</sub> is: Lys, Asp, Arg, or Glu;

Xaa<sub>36</sub> is: Gly, Pro, or Arg;

Xaa<sub>37</sub> is: Gly, Pro, Ser, or Lys;

Xaa<sub>38</sub> is: Ser, Pro, His, or Lys;

Xaa<sub>39</sub> is: Ser, Arg, Thr, Trp, Lys, NH<sub>2</sub>, or is absent;

Xaa<sub>40</sub> is: Ser, Gly, Lys, NH<sub>2</sub>, or is absent;

Xaa<sub>41</sub> is: Ala, Asp, Arg, Glu, Lys, Gly, Lys, NH<sub>2</sub>, or is absent;

Xaa<sub>42</sub> is: Pro, Ala, Lys, NH<sub>2</sub>, or is absent;

Xaa<sub>43</sub> is: Pro, Ala, Lys, NH<sub>2</sub>, or is absent;

Xaa<sub>44</sub> is: Pro, Ala, Arg, Lys, His, NH<sub>2</sub>, or is absent;

Xaa<sub>45</sub> is: Ser, His, Pro, Lys, Arg, NH<sub>2</sub> or is absent;

Xaa<sub>46</sub> is: His, Ser, Arg, Lys, NH<sub>2</sub> or is absent;

Xaa<sub>47</sub> is: His, Ser, Arg, Lys, NH<sub>2</sub> or is absent; and

Xaa<sub>48</sub> is Lys, NH<sub>2</sub>, or is absent;

provided that if Xaa<sub>39</sub>, Xaa<sub>40</sub>, Xaa<sub>41</sub>, Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, or Xaa<sub>47</sub> is absent each amino acid downstream is absent and further provided that the GLP-1

peptide does not have the following C-terminal amino acid extension beginning at Xaa<sub>36</sub>: Gly-Pro-Ser-Ser-Gly-Ala-Pro-Pro-Pro-Ser-NH<sub>2</sub>.

21. (original) The GLP-1 compound of Claim 20, wherein said GLP-1 peptide is modified at a Lys, and said Lys occurs at either Xaa<sub>37</sub>, Xaa<sub>38</sub>, Xaa<sub>39</sub>, Xaa<sub>40</sub>, Xaa<sub>41</sub>, Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, Xaa<sub>47</sub>, or Xaa<sub>48</sub>.
22. (original) A GLP-1 compound comprising an extended GLP-1 peptide modified with a reactive group that reacts with an amino group, a hydroxyl group, or a thiol group on a blood component to form a covalent bond, wherein said reactive group is selected from the group consisting of a succinimidyl group and a maleimido group, said extended GLP-1 peptide having the amino acid sequence of formula 13 (SEQ ID NO:13)

Xaa<sub>7</sub>-Xaa<sub>8</sub>-Glu-Gly-Thr-Xaa<sub>12</sub>-Thr-Ser-Asp-Xaa<sub>16</sub>-Ser-Xaa<sub>18</sub>-Xaa<sub>19</sub>-Xaa<sub>20</sub>-Glu-Xaa<sub>22</sub>-Gln-Ala-Xaa<sub>25</sub>-Lys-Xaa<sub>27</sub>-Phe-Ile-Xaa<sub>30</sub>-Trp-Leu-Xaa<sub>33</sub>-Xaa<sub>34</sub>-Gly-Xaa<sub>36</sub>-Xaa<sub>37</sub>-Xaa<sub>38</sub>-Xaa<sub>39</sub>-Xaa<sub>40</sub>-Xaa<sub>41</sub>-Xaa<sub>42</sub>-Xaa<sub>43</sub>-Xaa<sub>44</sub>-Xaa<sub>45</sub>-Xaa<sub>46</sub>-Xaa<sub>47</sub>-Xaa<sub>48</sub>-Xaa<sub>49</sub>-Xaa<sub>50</sub>-Xaa<sub>51</sub>

Formula 13 (SEQ ID NO:13)

wherein:

- Xaa<sub>7</sub> is: L-histidine, D-histidine, desamino-histidine, 2-amino-histidine, β-hydroxy-histidine, homohistidine, α-fluoromethyl-histidine, or α-methyl-histidine;
- Xaa<sub>8</sub> is: Ala, Gly, Val, Leu, Ile, Ser, or Thr;
- Xaa<sub>12</sub> is: Phe, Trp, or Tyr;
- Xaa<sub>16</sub> is: Val, Trp, Ile, Leu, Phe, or Tyr;
- Xaa<sub>18</sub> is: Ser, Trp, Tyr, Phe, Lys, Ile, Leu, Val;
- Xaa<sub>19</sub> is: Tyr, Trp, or Phe;
- Xaa<sub>20</sub> is: Leu, Phe, Tyr, or Trp;
- Xaa<sub>22</sub> is: Gly, Glu, Asp, or Lys;
- Xaa<sub>25</sub> is: Ala, Val, Ile, or Leu;
- Xaa<sub>27</sub> is: Glu, Ile, or Ala;
- Xaa<sub>30</sub> is: Ala or Glu
- Xaa<sub>33</sub> is: Val or Ile;
- Xaa<sub>34</sub> is: Lys, Asp, Arg, or Glu;

Xaa<sub>36</sub> is: Gly, Pro, or Arg;  
Xaa<sub>37</sub> is: Gly, Pro, or Ser;  
Xaa<sub>38</sub> is: Ser, Pro, or His;  
Xaa<sub>39</sub> is: Ser, Arg, Thr, Trp, or Lys;  
Xaa<sub>40</sub> is: Ser or Gly;  
Xaa<sub>41</sub> is: Ala, Asp, Arg, Glu, Lys, or Gly;  
Xaa<sub>42</sub> is: Pro, Ala, Lys, NH<sub>2</sub>, or is absent;  
Xaa<sub>43</sub> is: Pro, Ala, Lys, NH<sub>2</sub>, or is absent;  
Xaa<sub>44</sub> is: Pro, Ala, Arg, Lys, His, NH<sub>2</sub>, or is absent;  
Xaa<sub>45</sub> is: Ser, His, Pro, Lys, Arg, NH<sub>2</sub>, or is absent;  
Xaa<sub>46</sub> is: His, Ser, Arg, Lys, NH<sub>2</sub>, or is absent;  
Xaa<sub>47</sub> is: His, Ser, Arg, Lys, NH<sub>2</sub>, or is absent; and  
Xaa<sub>48</sub> is: Lys, NH<sub>2</sub>, or is absent;  
Xaa<sub>49</sub> is: Pro, His, Lys, NH<sub>2</sub>, or is absent;  
Xaa<sub>50</sub> is: Ser, His, Lys, NH<sub>2</sub>, or is absent; and  
Xaa<sub>51</sub> is: Lys, NH<sub>2</sub>, or is absent;

wherein said extended GLP-1 peptide is modified at a single Lys which occurs at one of Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, Xaa<sub>47</sub>, Xaa<sub>48</sub>, Xaa<sub>49</sub>, Xaa<sub>50</sub>, or Xaa<sub>51</sub>; and provided that if Xaa<sub>38</sub>, Xaa<sub>39</sub>, Xaa<sub>40</sub>, Xaa<sub>41</sub>, Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, Xaa<sub>47</sub>, Xaa<sub>48</sub>, Xaa<sub>49</sub>, or Xaa<sub>50</sub>, is absent each amino acid downstream is absent.

23. (original) The GLP-1 compound of Claim 22, wherein said GLP-1 peptide is modified at a Lys, and said Lys occurs at either Xaa<sub>37</sub>, Xaa<sub>38</sub>, Xaa<sub>39</sub>, Xaa<sub>40</sub>, Xaa<sub>41</sub>, Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, Xaa<sub>47</sub>, Xaa<sub>48</sub>, Xaa<sub>49</sub>, Xaa<sub>50</sub> or Xaa<sub>51</sub>.
- 24-25. (cancelled)
26. (original) A GLP-1 compound comprising a GLP-1 peptide modified with a reactive group that reacts with a thiol group on a blood component to form a covalent bond, wherein said reactive group is a succinimidyl group, said GLP-1 peptide having the amino acid sequence of formula 1 (SEQ ID NO:1)
- Xaa<sub>7</sub>-Xaa<sub>8</sub>-Glu-Gly-Thr-Xaa<sub>12</sub>-Thr-Ser-Asp-Xaa<sub>16</sub>-Ser-Xaa<sub>18</sub>-Xaa<sub>19</sub>-Xaa<sub>20</sub>-Glu-Xaa<sub>22</sub>-Gln-Ala-Xaa<sub>25</sub>-Lys-Xaa<sub>27</sub>-Phe-Ile-Xaa<sub>30</sub>-Trp-Leu-Xaa<sub>33</sub>-Lys-Gly-Arg-Xaa<sub>37</sub>

Formula 1 (SEQ ID NO:1)

wherein:

Xaa<sub>7</sub> is: L-histidine, D-histidine, desamino-histidine, 2-amino-histidine, β-hydroxy-histidine, homohistidine, α-fluoromethyl-histidine, or α-methyl-histidine;

Xaa<sub>8</sub> is: Ala, Gly, Val, Leu, Ile, Ser, or Trp;

Xaa<sub>12</sub> is: Phe, Trp, or Tyr;

Xaa<sub>16</sub> is: Val, Trp, Ile, Leu, Phe, or Tyr;

Xaa<sub>18</sub> is: Ser, Trp, Tyr, Phe, Lys, Ile, Leu, Val;

Xaa<sub>19</sub> is: Tyr, Trp, or Phe;

Xaa<sub>20</sub> is: Leu, Phe, Tyr, or Trp;

Xaa<sub>22</sub> is: Gly, Glu, Asp, Lys;

Xaa<sub>23</sub> is: Ala, Val, Ile, or Leu;

Xaa<sub>27</sub> is: Glu, Ile, or Ala;

Xaa<sub>30</sub> is: Ala or Glu;

Xaa<sub>33</sub> is: Val, or Ile; and

Xaa<sub>37</sub> is: L-Cys, D-Cys, homocysteine, or penicillamine;

wherein said GLP-1 peptide is modified at Xaa<sub>37</sub>; and

provided that the GLP-1 compound does not have the sequence of GLP-1(7-37)OH, GLP-1(7-36)-NH<sub>2</sub>, Gly<sup>8</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Tyr<sup>12</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Tyr<sup>12</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Tyr<sup>16</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Tyr<sup>16</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Glu<sup>22</sup>-GLP-1(7-



36)NH<sub>2</sub>, Ser<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Glu<sup>22</sup>-GLP-1(7-37)OH, Glu<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Asp<sup>22</sup>-GLP-1(7-37)OH, Asp<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Lys<sup>22</sup>-GLP-1(7-37)OH, Lys<sup>22</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-Ala<sup>27</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Glu<sup>30</sup>-Ala<sup>27</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-Glu<sup>30</sup>-GLP-1(7-36)NH<sub>2</sub>, Val<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Val<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Gly<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Gly<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Leu<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Leu<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Ile<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Ile<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Ser<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Ser<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>, Thr<sup>8</sup>-His<sup>37</sup>-GLP-1(7-37)OH, Thr<sup>8</sup>-His<sup>37</sup>-GLP-1(7-36)NH<sub>2</sub>.

27. (original) A GLP-1 compound comprising an extended GLP-1 peptide modified with a reactive group that reacts with a thiol group on a blood component to form a covalent bond, wherein said reactive group is a succinimidyl group, said extended GLP-1 peptide having the amino acid sequence of formula 3 (SEQ ID NO:3)

Xaa<sub>7</sub>-Xaa<sub>8</sub>-Glu-Gly-Thr-Xaa<sub>12</sub>-Thr-Ser-Asp-Xaa<sub>16</sub>-Ser-Xaa<sub>18</sub>-Xaa<sub>19</sub>-Xaa<sub>20</sub>-Glu-Xaa<sub>22</sub>-Gln-Ala-Xaa<sub>25</sub>-Lys-Xaa<sub>27</sub>-Phe-Ile-Xaa<sub>30</sub>-Trp-Leu-Xaa<sub>33</sub>-Xaa<sub>34</sub>-Gly-Xaa<sub>36</sub>-Xaa<sub>37</sub>-Xaa<sub>38</sub>-Xaa<sub>39</sub>-Xaa<sub>40</sub>-Xaa<sub>41</sub>-Xaa<sub>42</sub>-Xaa<sub>43</sub>-Xaa<sub>44</sub>-Xaa<sub>45</sub>-Xaa<sub>46</sub>-Xaa<sub>47</sub>-Xaa<sub>48</sub>

Formula 3 (SEQ ID NO:3)

wherein:

Xaa<sub>7</sub> is: L-histidine, D-histidine, desamino-histidine, 2-amino-histidine, β-hydroxy-histidine, homohistidine, α-fluoromethyl-histidine, or α-methyl-histidine;

Xaa<sub>8</sub> is: Ala, Gly, Val, Leu, Ile, Ser, or Thr;

Xaa<sub>12</sub> is: Phe, Trp, or Tyr;

Xaa<sub>16</sub> is: Val, Trp, Ile, Leu, Phe, or Tyr;

Xaa<sub>18</sub> is: Ser, Trp, Tyr, Phe, Lys, Ile, Leu, Val;

Xaa<sub>19</sub> is: Tyr, Trp, or Phe;

Xaa<sub>20</sub> is: Leu, Phe, Tyr, or Trp;

Xaa<sub>22</sub> is: Gly, Glu, Asp, or Lys;

Xaa<sub>25</sub> is: Ala, Val, Ile, or Leu;

Xaa<sub>27</sub> is: Glu, Ile, or Ala;

Xaa<sub>30</sub> is: Ala or Glu

Xaa<sub>33</sub> is: Val or Ile;

Xaa<sub>34</sub> is: Lys, Asp, Arg, or Glu;

Xaa<sub>36</sub> is: Gly, Pro, or Arg;

Xaa<sub>37</sub> is: Gly, Pro, Ser, L-Cys, D-Cys, homocysteine, or penicillamine;

Xaa<sub>38</sub> is: Ser, Pro, His, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>;

Xaa<sub>39</sub> is: Ser, Arg, Thr, Trp, Lys, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>40</sub> is: Ser, Gly, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>41</sub> is: Ala, Asp, Arg, Glu, Lys, Gly, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>42</sub> is: Pro, Ala, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>43</sub> is: Pro, Ala, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>44</sub> is: Pro, Ala, Arg, Lys, His, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>45</sub> is: Ser, His, Pro, Lys, Arg, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>46</sub> is: His, Ser, Arg, Lys, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>47</sub> is: His, Ser, Arg, Lys, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent; and

Xaa<sub>48</sub> is: L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

wherein said extended GLP-1 peptide contains a single L-Cys, D-Cys, homocysteine, or penicillamine which occurs at one of Xaa<sub>37</sub>, Xaa<sub>38</sub>, Xaa<sub>39</sub>, Xaa<sub>40</sub>, Xaa<sub>41</sub>, Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, Xaa<sub>47</sub>, or Xaa<sub>48</sub>, said GLP-1 is modified at said single L-Cys, D-Cys, homocysteine, or penicillamine; and provided that if Xaa<sub>39</sub>, Xaa<sub>40</sub>, Xaa<sub>41</sub>, Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, or Xaa<sub>47</sub> is absent each amino acid downstream is absent and further provided that the GLP-1 peptide does not have the following C-terminal amino acid extension beginning at Xaa<sub>36</sub>: Gly-Pro-Ser-Ser-Gly-Ala-Pro-Pro-Pro-Ser-NH<sub>2</sub>.

28. (original) A GLP-1 compound comprising an extended GLP-1 peptide modified with a reactive group that reacts with a thiol group on a blood component to form a covalent bond, wherein said reactive group is a succinimidyl group, said extended GLP-1 peptide having the amino acid sequence of formula 6 (SEQ ID NO:6)

Xaa7-Xaa8-Glu-Gly-Thr-Xaa12-Thr-Ser-Asp-Xaa16-Ser-Xaa18-Xaa19-Xaa20-Glu-Xaa22-Gln-Ala-Xaa25-Lys-Xaa27-Phe-Ile-Xaa30-Trp-Leu-Xaa33-Xaa34-Gly-Xaa36-Xaa37-Xaa38-Xaa39-Xaa40-Xaa41-Xaa42-Xaa43-Xaa44-Xaa45-Xaa46-Xaa47-Xaa48-Xaa49-Xaa50-Xaa51

Formula 6 (SEQ ID NO:6)

wherein:

- Xaa7 is: L-histidine, D-histidine, desamino-histidine, 2-amino-histidine,  $\beta$ -hydroxy-histidine, homohistidine,  $\alpha$ -fluoromethyl-histidine, or  $\alpha$ -methyl-histidine;
- Xaa8 is: Ala, Gly, Val, Leu, Ile, Ser, or Thr;
- Xaa12 is: Phe, Trp, or Tyr;
- Xaa16 is: Val, Trp, Ile, Leu, Phe, or Tyr;
- Xaa18 is: Ser, Trp, Tyr, Phe, Lys, Ile, Leu, Val;
- Xaa19 is: Tyr, Trp, or Phe;
- Xaa20 is: Leu, Phe, Tyr, or Trp;
- Xaa22 is: Gly, Glu, Asp, or Lys;
- Xaa25 is: Ala, Val, Ile, or Leu;
- Xaa27 is: Glu, Ile, or Ala;
- Xaa30 is: Ala or Glu
- Xaa33 is: Val or Ile;
- Xaa34 is: Lys, Asp, Arg, or Glu;
- Xaa36 is: Gly, Pro, or Arg;
- Xaa37 is: Gly, Pro, or Ser;
- Xaa38 is: Ser, Pro, or His;
- Xaa39 is: Ser, Arg, Thr, Trp, or Lys;
- Xaa40 is: Ser or Gly;
- Xaa41 is: Ala, Asp, Arg, Glu, Lys, or Gly;
- Xaa42 is: Pro, Ala, L-Cys, D-Cys, homocysteine, penicillamine,  $\text{NH}_2$ , or is absent;
- Xaa43 is: Pro, Ala, L-Cys, D-Cys, homocysteine, penicillamine,  $\text{NH}_2$ , or is absent;

Xaa<sub>44</sub> is: Pro, Ala, Arg, Lys, His, NH<sub>2</sub>, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>45</sub> is: Ser, His, Pro, Lys, Arg, Gly, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>46</sub> is: His, Ser, Arg, Lys, Pro, Gly, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>47</sub> is: His, Ser, Arg, Lys, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>48</sub> is: Gly, His, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>49</sub> is: Pro, His, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

Xaa<sub>50</sub> is: Ser, His, Ser-NH<sub>2</sub>, His-NH<sub>2</sub>, L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent; and

Xaa<sub>51</sub> is: L-Cys, D-Cys, homocysteine, penicillamine, NH<sub>2</sub>, or is absent;

wherein said extended GLP-1 peptide contains a single L-Cys, D-Cys, homocysteine, or penicillamine which occurs at one of Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, Xaa<sub>47</sub>, Xaa<sub>48</sub>, Xaa<sub>49</sub>, Xaa<sub>50</sub>, or Xaa<sub>51</sub> said GLP-1 is modified at said single L-Cys, D-Cys, homocysteine, or penicillamine; and provided that if Xaa<sub>42</sub>, Xaa<sub>43</sub>, Xaa<sub>44</sub>, Xaa<sub>45</sub>, Xaa<sub>46</sub>, Xaa<sub>47</sub>, Xaa<sub>48</sub>, Xaa<sub>49</sub>, or Xaa<sub>50</sub>, is absent each amino acid downstream is absent and further provided that if Xaa<sub>36</sub> is Arg and Xaa<sub>37</sub> is Gly or Ser, the GLP-1 peptide does not have the following C-terminal amino acid extension beginning at Xaa<sub>38</sub>: Ser-Ser-Gly-Ala-Pro-Pro-Ser-NH<sub>2</sub>.

29. (currently amended) The GLP-1 compound of ~~any of Claims 2, 3, 9, 10, 18, 19, or 26~~ Claim 2 provided that the GLP-1 compound does not differ from GLP-1(7-37)OH or GLP-1(7-36)NH<sub>2</sub> by more than 5 amino acids.
30. The GLP-1 compound of Claim 29 provided that the GLP-1 compound does not differ from GLP-1(7-37)OH or GLP-1(7-36)NH<sub>2</sub> by more than 4 amino acids.
31. The GLP-1 compound of Claim 30 provided that the GLP-1 compound does not differ from GLP-1(7-37)OH or GLP-1(7-36)NH<sub>2</sub> by more than 3 amino acids.
32. (currently amended) The GLP-1 compound of ~~any of Claims 4, 8, 11, 15, 20, 23, 27 or 28~~ Claim 7 wherein the first 31 amino acids of the peptide do not differ from GLP-1(7-37) by more than 6 amino acids.

33. The GLP-1 compound of Claim 32 wherein the first 31 amino acids of the peptide do not differ from GLP-1(7-37) by more than 5 amino acids.
34. The GLP-1 compound of Claim 33 wherein the first 31 amino acids of the peptide do not differ from GLP-1(7-37) by more than 4 amino acids.
35. (currently amended) The GLP-1 compound of Claim ~~33~~ 34 wherein the first 31 amino acids of the peptide do not differ from GLP-1(7-37) by more than 3 amino acids.
36. (currently amended) A conjugate comprising a GLP-1 compound of ~~any of claims 1 through 35~~ Claim 1 covalently bonded ex vivo to a blood component.
37. (currently amended) A conjugate comprising a GLP-1 compound of ~~any of claims 1 through 35~~ Claim 1 covalently bonded ex vivo to a blood serum albumin.
38. (currently amended) A method for extending the in vivo half-life of a GLP-1 compound as claimed in ~~any of claims 1 through 35~~ Claim 1, comprising reacting said reactive group of said pharmaceutical composition with a thiol group on a blood component in vivo.
39. A method for extending the in vivo half-life of a GLP-1 compound as claimed in ~~any of claims 1 through 35~~ Claim 1, comprising reacting said reactive group of said pharmaceutical composition with a thiol group on blood serum albumin in vivo.
40. A method of stimulating the GLP-1 receptor in a subject in need of such stimulation, said method comprising the step of administering to the subject an effective amount of the GLP-1 compound of ~~any one of Claims 1 through 35~~ Claim 1.
41. The method of Claim 40 wherein the subject is being treated for non-insulin dependent diabetes.

42. The method of Claim 40 wherein the subject is being treated prophylactically for non insulin dependent diabetes.
43. The method of Claim 40 wherein the subject is being treated for obesity.
44. The method of Claim 40 wherein the subject is being treated for stroke, myocardial infarction, stroke, stress-induced hyperglycemia, or irritable bowel syndrome.
- 45-47. (cancelled)